

AMERICAN VETERINARY REVIEW,

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ORIGINAL ARTICLES.

REPORT ON THE RECENT CATTLE DISEASE IN KANSAS.

BY PROF. JAMES LAW, of Cornell University.

Hon. H. F. French, Assistant Secretary, United States Treasury:

SIR:—I have the honor to submit the following report on the disease of cattle which has recently prevailed at certain points in the States of Kansas and Illinois, and which was erroneously announced to be the *foot and mouth disease* of the Old World.

The first report of the disease was on March 3, in a telegram sent from Neosho Falls, Woodson County, Kansas, by Lieutenant-Governor Finney, to apprise Governor Glick that "the foot and mouth disease was prevailing to an alarming extent in that vicinity."

A company from Emporia, consisting of three cattle-raisers and a veterinarian, at once visited the Neosho district and pronounced the malady to be unquestionably the *foot and mouth disease*. The day following the Governor conveyed Dr. Holcombe, D.V.S. of the United States Army, stationed at Leavenworth, to the district, and still the same conclusion was arrived at.

In a letter of March 8, which I received from Mr. W. N. D. Bird, a stock-raiser in Greenwood and Lyon Counties, and who made one of the first party of four to visit Neosho Falls, the following statements occur:

In the herd of Mr. Beard, two miles north of Neosho Falls, we saw three animals which had been isolated from the rest of his cattle. One was an aged cow, which was lying down, had a temperature of 103.5° , blisters on the root of the tongue, swelling of the pharynx, ulceration of the left hind foot extending upon the first phalanx and around the coronet. The other two were two-year old steers, and had the feet much more extensively diseased. One animal had lost one of the horny digits, and in the second, one of the pair was coming off. In the mouths were blisters from the size of a lentil to that of a large pea, extending the whole length of the tongue, on the mucous membrane of the mouth and on the upper and lower labiae.

One animal had died the same morning, after two days' illness, the immediate cause of death appearing to be acute intestinal inflammation. Mr. Beard's herd was only infected ten days after he had purchased a cow from Mr. Keith, who occupies a place two miles farther north, on which the disease first appeared. * * * At Mr. Keith's we found a terrible state of things. Out of 120 head there was hardly one which had not been sick, or was sick, or just taking the disease. In one lot were 25 head of calves, of which fully half the number had lost either one or two feet (entirely gone); others were coming off. Some were ulcerated as far up as between the hock and fetlock. Then their mouths were very badly affected. What made it more conclusive that it was apthia was that a calf had died in two days after the cow had been taken. On examining the udder blisters and ulcerations were found on the mammae. Across the road were kept 95 head, consisting of young stock and cows, and of these we found 25 or 30 affected fully as badly as Mr. Keith's. This herd is owned by Messrs. Goodrich and Hindman. It is apthia without a doubt, and in a most virulent form. * * * On Thursday (March 6) Governor Glick, Dr. Holcombe, and Mr. Sims, of the State Board of Agriculture, accompanied by a number of our citizens, went down. Dr. Holcombe confirmed it without a doubt. * * *

The Emporia *Republican* for March 7 furnishes the following:

There can no longer be any question whatever as to the nature of the disease.

I had been very doubtful whether the reports would be verified. I did not expect to find *the foot and mouth disease*, but was prepared to find another. It is a specific disease, which takes its own time and terminates either fatally or otherwise. In my judgment, only a few will die. The majority of the cattle examined showed the characteristic evidences of this peculiar disease. In the more recently discovered cases the very high temperature was found which belongs to this epidemic—about 104° Fah. One of the most positive proofs of the correctness of the diagnosis is the death of Keith's calf several days after the mother was taken with disease. The disease poisons the milk, and thus killed the calf, which was only a few days old. The characteristic ulcerations of the alimentary canal and mouth were also found.

As thus presented the evidence was overwhelming in favor of *foot and mouth disease*, and I decided to go at once to Kansas, but first consulted you as to the availability of any part of the Treasury appropriation for stamping out the disease in case it was

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found to be still very circumscribed. Before I received an answer it transpired that the Commissioner of Agriculture had been notified and had sent Drs. Salmon and Trumbrower to Neosho Falls. The matter having been taken in hand by one Department of the National Government, I concluded that it would be undesirable for a second Department to incur the unnecessary expense of an independent investigation, and submitted this reason in a letter addressed to yourself.

Dr. Salmon concluded that the disease was *dry gangrene*, caused by feeding on ergoted hay, and on my visit to Washington, March 31, I saw the specimens of diseased limbs which he had sent from Neosho Falls, and recognized them at once as corresponding in every respect with the dry gangrene with which I am familiar as occurring in the Northeastern States from a similar cause. I further saw the specimens of badly ergoted hay which Dr. Salmon had taken from the farms occupied by the diseased herds in Kansas, Missouri, and Iowa, and became fully satisfied that the dreaded malady was after all only the comparatively familiar *dry gangrene*.

Before reaching this conclusion I had telegraphed the Governors of Kansas and Missouri that the importance of the subject to the nation and to England demanded that the nature of the disease should be demonstrated in every separate outbreak by the inoculation of several sheep and swine. These would contract foot and mouth disease with almost unfailing certainty, whilst they fail to contract other affections which were likely to be mistaken for this. March 24 I had a telegram from Governor Crittenden, of Missouri, "There is not a case of foot and mouth disease in Missouri. Experts pronounce disease frozen feet. *Disease won't communicate.*" Governor Glick, of Kansas, intimated that experiments would be made to test the communicability of the disease by cohabitation and inoculation.

Two weeks passed without the announcement of any positive results from these experiments in Kansas, and it seemed to be settled, not only that the prevailing affection was dry gangrene, but that no other disease developing so rapidly as foot and mouth disease coexisted with it.

On April 8 came the announcement that a veterinary expert sent by the Canadian Government had pronounced the disease at Neosho Falls, Kans., and at Effingham, Ill., to be unquestionably *foot and mouth disease*. I at once telegraphed Governor Glick to ascertain whether there were any fresh cases which would furnish virulent matter for experimental inoculation, and having been assured that fresh cases were appearing as the result of cohabitation I started the same night, April 10, for Kansas. I reached Topeka April 13, waited one day for the Governor's arrival, and having received his assurance of all possible facilities for the conducting of the necessary experiments, I went to Neosho Falls, where I was met by Dr. Holcombe, now State Veterinarian, and Messrs. Hamilton and White, of the Cattle Commission, who accompanied me at once to the diseased herds. The state of the four affected herds at this time may be shortly described as follows:

State of herds at Neosho Falls.

Owners.	Total number of cattle in original herd.	Number attacked up to date.	Number that died or had been killed.
Keith's.....	123	Nearly all	15
Hindman's.....	96	35	30
Beard's.....	75	4	4
Prebinow's.....	180	12+	4

The following points were noted:

1st. All cattle that had suffered severely and survived showed the unequivocal lesions of *dry gangrene*. A number had lost not only the hoofs but the terminal bones of the digits which are inclosed within the hoofs; others had lost the skin, soft tissues, and bones up to the fetlock joint on one or more feet. In one or two the separation had taken place or was now being effected above the fetlock. In the carcasses of those that had been killed the dry gangrene was even more extensive than in the living.

2d. The cow (Keith's) which had lost its calf after two days' illness had ten inches of its tail and a portion of its right ear in a gangrenous state, and nearly ready to drop off. These I secured as specimens.

3. At Keith's and Beard's herds of swine had run with the

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diseased cattle throughout, but had shown neither lameness nor sore mouth. At Hindman's a herd of pigs ran in the yard with the sick cattle until the hoofs of the latter began to slough off, when they were shut out lest they should ruin the stock by gnawing them. At the time of our experiments a young litter (three weeks old), too small to be kept out by the fence, ran freely with the sick cattle in the yard. The older hogs were only separated from the cattle by a common board fence; yet at no time did any of these swine, young or old, manifest any symptoms of lameness or sore mouth.

PROBABILITIES OF INFECTION WITH FOOT AND MOUTH DISEASE.

None of the affected herds were on the line of any railway where infecting material might have been dropped. No strangers were employed about the farms, so that the fancy that infection had been introduced in the clothing of emigrants had to be abandoned. No connection could be established with any recently imported animals. Keith's herd, the first to be attacked, had received, December 13, an accession of 63 calves (now yearlings), purchased from Mr. Davis in the northern part of Allen County, and these were the first to be attacked, ten day after arrival, yet inquiry at Mr. Davis's could elicit no evidence that his stock had suffered. Mr. Davis had picked up these calves mainly in Woodson County, intending to hold them, but sold on being offered a profit. All did well while on his hands, as did also his other cattle after they left. Keith bought 8 more calves February 2, which were in due time attacked like the others; one was also bought December 17 of Mr. Inge, whose remaining cattle continued sound. Keith and his nephew have farms on opposite sides of Hindman's, and Keith and his dog frequently crossed through among Hindman's cattle, yet the latter kept well for seven weeks after Keith's were attacked. Hindman's cattle passed once over the road used by Keith's, but this was six weeks before the former were attacked, which entirely excludes foot and mouth disease, as that would have developed within a week. Beard purchased a cow from Keith, and ten days later his stock were attacked, but the first to suffer was one of the former herd,

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while the Keith cow was attacked later. The herds of Prebinow and O'Toole, and that in Osborne County, were attacked independently of any ascertained communication with herds previously affected.

In the search for infection, it was discovered that some Hereford cattle in Allen County had been imported through Portland, Me., and the recent disease in the quarantine there was at once invoked as a source of infection. But the disease began in Keith's herd on December 23, 1883, while the infected cattle were only landed at Portland on February 2, 1884, and were still in quarantine there April 15, when I was in Kansas investigating this outbreak. The cattle in Allen County were imported early last year.

From these facts it follows that there is no evidence of the introduction of any infection into Kansas; that there is no certainty that infection has been transmitted from herd to herd; that in the one case in which there was a suspicion that a newly-purchased cow had introduced the disease, the cow in question was attacked later than the other members of the herd; that in some herds a few cattle only suffered; and that on all farms the hogs, without exception, escaped. Such an experience is utterly incompatible with the idea of *foot and mouth disease*, the contagion of which rarely spares a single member of a herd of cattle mingling in the same yard, and is as virulent to pigs as to the bovine race.

ASSUMED INFECTION FROM ANIMAL TO ANIMAL.

At first the number of animals in one herd which contracted the disease in rapid succession naturally aroused suspicion of contagion, and later certain facts were held to demonstrate the same. Six cattle placed March 27 in a small yard built in Keith's corral, in company with six cattle with gangrenous limbs, and with access to hay like that formerly consumed by the latter, were attacked with sore (vesiculated) mouths on the eighth day, and one went lame, but Mr. Hamilton says the lameness disappeared when he removed some hardened mud from between the hoofs. The temperature of some of these animals rose to 104° Fah. On my ar-

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rival seven days later, the cicatrices in the mouths of two were still visible, but the temperature was normal and the feet showed no evidence of having suffered. The fact that these cattle were for a week subjected to the same causes that induced the disease in the original herd invalidates any theory of contagion in their case. To correct this four additional fresh cattle were placed for twenty-four hours in the same yard with the six, and then the ten cattle and six sheep were, April 11, placed in a small yard, built on to the fence of Keith's corral and supplied with swamp hay, clear of ergot, corn in the ear, and well water. On April 14 these four had temperatures varying from 103.3° to 103.8° Fah., and one showed a blush of the hard palate, tenacious mucus in the mouth, and a film of mucus on the feces. Next morning the temperatures were 103.3° to 104.3° Fah. On my first arrival, the same night, the temperatures were once more natural, and there were no lesions of mouth, feet, nor teats. After this they showed no symptom of illness. The sheep also had a natural temperature and no sign of lesion of mouth nor feet.

Up to this point there was no more than a mere presumption of infection. The first six cattle experimented on, and which had the slight eruption in the mouth, had been subjected to conditions like those producing the disease in the original herd. These conditions were probably intensified, as the small yard in which they were confined was some distance from both pond and pump, and it seems fair to assume that water was not so constantly accessible. The exposure to these conditions was for a limited time, it is true, but their suffering was proportionally slight, and the presumption is quite as strong for the development of the disease from these conditions as from contagion. The second lot of four cattle had been subjected to these conditions for twenty-four hours only, and they suffered from digestive disorder with attendant fever, but this was quite transient and was unattended by any visible eruption. The sheep which escaped the inimical conditions in the first small yard, and were merely subjected to contact with the six diseased cattle, showed no evidence of disease, not even elevated temperature.

While these experiments may, perhaps, be held to leave the

buestion of the transmission of the disease from ox to ox by contagion in doubt, they cannot by any means be accepted as demonstrating such contagion. They demonstrate, however, that the malady is not readily contagious to sheep, as it had already been shown that it was not contagious to swine. This excludes absolutely the idea of foot and mouth disease.

TRANSMISSION TO YOUNG CALVES.

In one case mentioned above a young calf in Keith's herd died with severe intestinal lesions while its dam was at the height of the disease. At Prebinow's, April 17, I found a calf five days old (suckled by a cow with sloughing feet) suffering with swollen pasterns, rawness between the hoofs on all four feet, and with a white, solid, aphthous concretion three-fourths of an inch in diameter covering a red congested surface beneath the tongue on the left side. This concretion was not a blister as in foot and mouth disease, but resembled rather that observed in *thrush* (*Muguet*) in young animals or the epithelial hypertrophy of rinderpest. Under the microscope it was seen to be made up largely of micrococcus and the mycelium of fungi. Prebinow's cattle had been fed on millet, hay, and corn stacks.

The tender age of this last calf forbade the idea that it had contracted the disease through feeding on ergoted hay, and the fact that it was confined to a small corral, covered to the depth of a foot and a half with straw and manure, excluded the possibility of injury from irritating mud or wet. There remained, therefore, three possible sources of the disease. 1st, contagion from its diseased companions; 2d, infection from the morbid excretions of the sick; and 3d, the ingestion of the original poison with the milk furnished by its sick dam.

The claim of the transmission of a specific contagium is effectually disposed of in the experiments recorded below. The claim of infection from the excretions and morbid products of the sick (including the septic matter from the gangrenous limbs) on the one part, and the transmission of the original poison (the active principles of ergot, perhaps,) on the other, may be held as still undetermined, and it is to be hoped that Dr. Holcombe may

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still find time to inquire into this experimentally. At present there is a strong presumption of the poisoning of the mouth and system through the milk, and of the feet through the fæces. At the same time the occurrence of two cases of what seem to have been septic wounds in man (Dr. Trumbrower and Mr. Keith) from handling the diseased parts suggests the probable action of the putrid products from the gangrenous feet.

INOCULATION EXPERIMENTS.

On my arrival at Neosho Falls I lost no time in starting inoculations. In the absence of a fresh case of the disease on the morning of April 16, I scraped the surface of the eschars in the mouth of the most recent victim, attacked six days before, and inoculated two sheep, one on the upper lip and pad covering the intermaxillary bone, and the other on the upper lip and interdigital space. Next day the wound on the interdigital space had a small scab on a reddish base, but all the sores healed with great rapidity, and at no time was there any symptom of fever.

April 17 took matter from the buccal concretion of Prebinow's sick calf (five days old), and the same day inoculated therewith a heifer (one of the last four added to Keith's small corral) on the lower gum and left ear. Next day at Beard's, inoculated two three-months-old pigs which had been kept in a pen apart from the cattle, and a half-bred Galloway calf twenty-four hours old. These were all watched closely till April 20, and the three last until April 21, but all the wounds healed rapidly and no constitutional disorder was observed at any time.

These negative results of the inoculation of matter from a fresh cow on cattle, sheep, and swine not only exclude any possibility of foot and mouth disease, but further demonstrate the disease is either not transmissible at all by contagion or inoculation, or if it be still held to be communicable from a first case to a second, that it is not transferable from a second to a third. We are fully warranted, therefore, in the claim that the affection cannot be perpetuated indefinitely after the manner of an animal plague, and that there is no danger of the generation in this way of a scourge which shall enter the channels of our cattle traffic and

carry devastation to the herds of the other States. It need not be claimed that a septic or other infection cannot be conveyed from the first victim, the limbs of which are sloughing off; the decision of this can be determined by further experiment. It is enough for the purposes of interstate and international commerce that all inoculations, from other lesions than those of the gangrenous extremities, have failed to transmit any disease whatever.

OUTBREAKS IN ILLINOIS.

On leaving Kansas I went, in company with Dr. Salmon, of the Agricultural Department, to visit the diseased herds in Central Illinois, which had also been pronounced *indisputable cases of foot and mouth disease*. We visited the following:

1. The herd of Lemuel Faunce, near Montrose, Cumberland County, 10 miles north by east of Effingham. Here the cattle were kept in a sloping yard adjoining a large wood lot and bounded by it on two sides. This yard contained two ponds supplied by springs, but also receiving considerable surface drainage from the manure-covered yard. To water the cattle during frost, holes had been broken in these ponds every morning. The stock had been fed hay and corn, the former largely composed of red top (*Acorostis vulgaris*) badly affected by ergot, and much worse than that of the previous year, 1882, some of which was still preserved and available for comparison. Twenty-one head had been attacked (fifteen grown cattle and six two-year-olds), of which two had been killed, five were still lame, and the others had recovered. One cow had lost both hind limbs up to the hock. There was only one pig kept, but it had entirely escaped. We, however, found four pigs belonging to a neighbor, rooting in Faunce's yard, but no harm came to themselves nor to their owner's other stock through such visits. Two old horses, kept all winter in the yard with the cattle, had had sores in the mouths and still showed circumscribed indurated white nodules on the mucous membrane covering the upper lip. Two two-year-old horses wintered with the cattle slobbered from March 1 to April 9. Both horses and cattle are said to have made a smacking noise with their mouths while they were sore. The first animal to be attacked was a dun steer, bred on

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the place, and which took the disease in the latter part of December; had a relapse later, and at the time of our visit, April 24, had the left hind foot sloughing off at the fetlock. One heifer had had two relapses.

The disease in all cases began with violent diarrhea, and in a week or two later the legs swelled or stiffened, then cracked around as if cut with a blunt instrument, and finally dropped off.

2. Mr. Mason's, Island Grove, Wheeler, Jasper County, 18 miles east of Effingham, had 120 head of cattle, of which 17 head suffered, 6 had been killed, 2 of the survivors had each lost a hind leg to up near the hock, and several others were still lame. The two that had lost limbs were in high fever, with fetid breath, but no visible lesions of the mouth. Running with this herd throughout the period of sickness were 100 hogs and 50 sheep, not one of which had been observed to suffer at any time. There were also 25 horses and mules which were turned out into the yards when not at work, but none of them had been observed even to slobber. The hay on this farm consisted mainly of red-top run to seed and largely affected with ergot.

3. Mr. Wetherholt, of Wheeler, had a family cow, fed on similar hay, and at time of our visit she was down, unable to rise, and her hind limbs were sloughing off near the hocks.

4. A cow kept in barn connected with the boarding-house at Wheeler, fed on the same kind of hay with much ergot, was found suffering from the preliminary symptoms of diarrhea, slight fever, and impaction of the paunch, but lameness had not yet set in. The person in charge explained that she had only been a few days on this hay.

5. Mr. Keating, 6 miles northwest of Effingham, out of a herd of 45 calves and 6 cows, had 24 of the former attacked, mostly in a mild form, the first cases having been in the first week of January. Eight were killed and several others lost feet and now walk on the stumps. Sixty pregnant ewes ran with the diseased calves and escaped, as did also 6 cows and a small herd of pigs.

In addition to the above cases visited, we had authentic information of the existence of the disease at the following points:

6. At Du Brock's, 3 miles north and 1 mile west of Faunce's,

in a herd of 160 cattle, 8 calves suffered severely, though kept in a high, dry, warm, well littered shed, excluding the idea of freezing. Twelve goats running with the sick cattle entirely escaped.

7. Price, near Faunce's, had his single family cow attacked.

8. Kibler, 4 miles east of Mason's, had 10 cattle attacked in a herd of 50 head.

9. Alexander Wilson lost three steers out of a herd of 100 head.

10. Gibson had 6 head attacked out of a herd of 50.

11. Seling had 2 attacked in a herd of 20.

12. Truman, 3 miles southwest of Newton, had his cattle kept in a barn, yet several lost feet and legs.

13. Washington Holmes lost several from sloughing of the limbs.

14. George Lewis, Effingham County, had 10 attacked in a herd of 40 or 50 in the course of the last five or six weeks.

15. John Donaldson had 5 or 6 attacked out of 50 or 60.

16. List, of Wheeler, Jasper County, had 2 or 3 lame.

17. Schumacher, at Diederich's, near county line (Effingham and Jasper Counties), had 2 or 3 sick.

18. A. M. Bayles, near Stewart (Wabash road), lost two or three head.

Here we have an affection scattered over an extensive district, without any reference to contagion; a disease of which there is no evidence of extension from one herd to adjacent ones by contact; a disease which in different instances attacked a percentage only of the cattle exposed, while the large majority at such times escaped, in spite of the freest exposure; a disease which in every instance failed to attack sheep, swine, and goats, though these mingled freely with the sick; a disease which has persisted in a single herd confined to the limits of a small yard, for four months in succession, and has in this time relapsed in the same animal with renewed energy twice in succession, and ended in sloughing of limbs; a disease which in the one case in which it has been shown to attack solipeds has maintained sore mouth and salivation for six weeks, and we are told that this must be the contagious foot and mouth disease of Europe. In answer, it is safe to assert

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that the demonstration of any one of the aboved-named eight prominent features of this affection forbids absolutely the idea that it is *foot and mouth disease*. How much more, then, is that malady excluded under the combined antagonism of all these eight counts.

(*To be continued.*)

INOCULATION OF BACILLAR PHTHISIS.

(Extracts from Mr. G. SEE on Phthisis Pulmonalis.)

Continued from page 171.

Tuberculosis inoculated through the eye.—We have here a mode of demonstration which is placed beyond question, inasmuch as it permits us to follow step by step all the phenomena of the contact of the tuberculous bacillus upon the various tissues of the eye.

It is Cohnheim who originated the ingenious idea of introducing the tuberculous matter into the anterior chamber of the eye. The recent experiments of Baumgarten, published as "*The Demonstration of the Pathogenic Value of Tuberculous Bacilli by Histology*," leave no room for doubt as to the insertion of the virus and the gradual development of the bacilli in the media of the eye. The tuberculo-bacillar substance being introduced into the anterior chamber of the organ for the first four days, no alteration is observed, the tissues of the eye appearing unchanged, yet every day the bacilli are visibly developing themselves in statu. Towards the fifth day they are observed to be extending and increasing in number, and outside of the tuberculous fragment, to occupy the cornea and the iris, and it is in the parts where they most abound in number, and all around them, that new so-called epitheloid cells are found. These appear first in small numbers, then increasing, and again, still more numerous, until the tuberculous nodule is found, the size of the tubercle and the abundance of the epitheloid cells always corresponding to the numbers of the bacilli.

Facts occurring in a similiar order are observed in the kidneys

also, which become loaded with bacilli; the parasites gathering in the glomerulæ, even when the renal structure is still quite intact. It is to be observed that the subjects of these experiments have been rabbits, which constitute the ground of culture most favorable to the bacilli, the tubercle always progressing and developing favorably and well in this animal. It is not the same with the dog, which is but slightly subject to tuberculosis and so effectually resists the experimental treatment that the inoculated tuberculosis is generally of a character only, and refuses to extend further. (*Friedlander.*)

Inoculated Bacilli.—When the tubercle remain of an imperfect and neutral character, and lacking in actual virulency, it becomes necessary to submit the bacillus itself to the direct experiment of inoculation. For this purpose Koch has employed every practicable precaution in order to perfect his experiments and remove them from all reasonable doubt or question.

Implantation of Bacilli into the Eye, the Peritoneum and the Blood.—Bacilli have been cultivated upon the coagulated serum of the blood; these gathered upon platinum wires passed to the fire, in such a manner that the liquid of culture was freed from all trace of blood, and of all other microphytes, and was composed exclusively of bacilli. These were obtained either from the tuberculous matter of man, viz., from human lungs affected with granulations or caseous pneumonia, or from the lung of monkeys, the inoculation being made by the mode of injection into the anterior chamber, through the cornea. In all these cases, irrespective of what animal had been operated upon, the same phenomena as those of the inoculation of tuberculous substance were observed. With a liquid poor in bacillus, a nodule was slowly developed which gradually involved the lymphatic glands, which became caseous; from thence the morbid process extends through the blood to the other organs. Or, again, when the liquid of culture was rich in bacilli, the tissue in which it had been implanted, together with the lymphatic system, become rapidly affected, and numerous nodules appear in the lungs, the spleen and elsewhere, as if the bacilli had been injected in the blood. May not these differences in the development of the

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bacillar action furnish the reason why some tubercles stop and limit their growth, and in other circumstances, why the invasion becomes so rapid and general?

Bacillar Injections in the Peritoneum.—Here the same effects are observed, according to the quantity of bacilli inserted. When the operation is performed on animals refractory, or but slightly subjects to tuberculosis, as the dog, the rat, and white mice, they die only after several months, presenting then a very abundant eruption of tubercles in the viscera of the abdomen, though very few in the lungs.

These undeniable facts prove even the superiority of the bacillar to the tuberculous infection. And here is another proof: rats were fed, during several months, with tuberculous substances, without showing any visible effect. Tuberculous inoculations also failed. When the injection of the bacillus was made in the peritoneum, an extensive eruption of tubercles followed.

Bacillar Injection into the Veins.—When thoroughly pure liquid, free from solid particles, is injected into the blood itself, a miliary tuberculosis, more rapid and extended than the *spon-taneous* one, is developed.

EXTERNAL CAUSES.

External Origin and Internal Development of the Bacillus.
—I. *Parasitic Life.*—The bacillus, as demonstrated by experimentation under all its forms, being the only factor of tuberculosis, it becomes necessary to inquire into its origin. Whence does it come? Is it from the surrounding media, and is it independent of animal or human organism? If it has an external origin—if, for instance, it exists everywhere that there are animal or vegetable matters in putrefaction, and if it can live in them and produce and multiply its spores, we shall be unable to protect ourselves. But fortunately it is not so. The tuberculous bacillus is of much slower growth than other bacillæ, and only does so in the bloody serum and bouillon of meat, while a temperature of 30° Centi., night and day, is necessary to its development. This temperature may continue unaltered for weeks; but when even these favorable conditions exist, which is not always possible,

they are soon interrupted, or rather diminished, by other bacilli more rapidly prolific and requiring less heat. There is then an antagonism, which forms one obstacle more to their atmospheric development, and they may almost be denominated mere parasites, which cannot live without their living supports. Differing from the carbuncular bacteria, which may complete their growth outside of the animal economy, that of the bacillus is accomplished only in the living body. It may produce its spores, which become free in the air, and may return into the organism, to transform themselves into bacilli, but they do not need the surrounding media to take their last and permanent form.

II. *Metamorphic Origin*.—Neither do they refer their origin to the common microphytes: the transformation advocated by Nægely, Büchner, has never been proved, either by morphology, or, especially, by experiment. Every kind of bacteria cannot produce tuberculosis, even in animals most predisposed to phthisis, as the guinea pig and the rabbit. Once developed, the tuberculous bacillus retains forever its miserable privilege; they have been seen perfect, in their liquids of culture, after two years; in sputa, even in putrefaction, they remain natural for six weeks.

RESISTING POWER OF THE BACILLI.

Their Antagonism to the Microbes of Putrefaction.—An interesting question presents itself in reference to the reciprocal and comparative action of parasites. Is there antagonism between the bacilli and the microbes of putrefaction? Falk* admits, from recent experiments, that the virulency of the bacillar tubercle is attenuated by putrefaction. He has inoculated tuberculous substances in putrefaction, and has obtained only local tuberculosis; but it is to be observed that the pus of suppuration coming from the inoculation of tuberculous putrified masses produced in other animals a manifest tuberculous infection. If, then, the tuberculous bacilli are really attenuated by the process of fermentation, from the first inoculation, they must, *a fortiori*, either produce no tuberculosis, or one weaker at the second. The question remains obscure.

* Berlin—Wohhens, 1883, No. 50.

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Baumgarten produces new experiments*. When milk, or a bacilliferous *fresh* liquid, which has proved its virulency, is exposed to the temperature of a room, or to warm air, so that it putrifies, it will produce but insignificant lesions, and the bacillus still conserves its character, viz.: its form and coloring reaction, it having then lost only its morbigeneous properties. Then, when a mixture is made of putrified pus with a liquid containing *fresh* bacilli, and this mixture is injected into the anterior chamber of the eye, one may see, notwithstanding the invasion of the parasites of fermentation into the tissues, the development of the tuberculosis taking place, and may conclude that it is only after a long contact of the bacelli with the substances in putrefaction that the former lose their power.

Resistance of the Sputa.—Schill and Fisher (*Memoire sur la desinfection des crachats phthisic*, 1883), go further, and hold that sputa submitted to putrefaction during several weeks retain their nociveous power; they have seen sputa in putrefaction preserved intact the forty-third day; their bacillar, notwithstanding the presence of numerous bacteria of putrefaction, and keep maintaining their phthisiogenic power; for when injected into guinea-pigs the animals become tuberculous. Their virulent property was not doubtful. Kussner confirms these facts. In injecting bacilliferous with ordinary ones he obtained entirely different and opposite results.

The resistance of the sputa to the action of antiseptics is no less marked. Absolute alcohol, salicylic acid and anilined water act only when in a very high degree of concentration. Phenic acid in the proportion of 5 per cent. may act. Dry heat at 100° for several hours disinfects them; a coction of 15 to 20 minutes is sufficient to produce the same result. It is especially to the spores and to their refractory state that the continuation of the deleterious action of the sputa is due.

Tuberculosis of Respiratory Origin.—Propagation by Inhaled Bacilliferous Air of Sputa.

1. *Condition of the Introduction of Bacilli into the Lungs.*—

* Centralblatt fur die Med. Wiss, 1884, No. 2.

The respiration of air loaded with the dust of dried sputa is the most certain mode of transmission of human phthisis. When sputa are coughed up on the ground, they dry and soon mix with the dust. When the patient soils his linen handkerchief (which he often uses to cleanse his mouth, which is constantly in contact with the virulent matter), there again is formed a kind of dry pulverulent dust, and it is known that the bacteria of the air are not isolated, in suspension, but that they are there only after the desiccation and the breaking up of the superficial layer of bacilliferous liquid, or when they are carried by a very volatile dust, as that coming from vegetable fibres, hairs or epidermic scales, as from clothing. This has been demonstrated by Hesse.

The virulency of these dried sputa continues for months, depending especially upon the greater or less complete growth of the bacilli and the quantity of spores they carry.

II.—Mode of Entrance Into the Respiratory Part—Numerous Obstacles.—When bacilliferous dust is inhaled it may, like other kinds, remain in the superior respiratory organs, or progress as far as the alveolæ, which is the case in deep respiration with the mouth open.

The nostrils already form an obstacle to the entrance into the respiratory canals; the larynx stops them or rejects them during coughing; when they arrive further it is not yet certain that they will remain there, as they are often turned back by the vibratory epithelium of the bronchiæ. As bacilli develop very slowly, they need the assistance of concurrent favorable circumstances to attach them. A stagnant mucous, for example, easily holds them; or, again, when adhesions of the lungs render it immovable, a vicious conformation of the chest produces the same result by preventing the entire dilatation of the lung, and so producing the accumulation of the exudation in the bronchiæ, where the bacillus not only fixes itself but readily develops.

INHALED BACILLIFEROUS LIQUID.

I.—Experiment of Koch.—The liquid of culture having been diluted and allowed to rest, a portion of it deposited, the slightly turbid superior layer was decanted and placed in a dose of 0.50

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cubic centimeters in a closet where eight rabbits, ten guinea-pigs, four rats and four mice were placed. After from fourteen to twenty-five days seven of the animals had died, and the others were killed after twenty-eight days. The lungs of the pigs and rabbits were filled with tubercles like those produced by the inhalation of dried tuberculous sputa, extending into the pulmonary alveolæ, as in spontaneous tuberculosis, which once more proves that this is truly a tuberculosis by inhalation.

Amongst the rats and rabbits the lesion was not as caseous as in the other animals.

In all cases the tubercles artificially obtained, reinoculated to other animals, never failed to produce general tuberculosis.

II.—Résumé.—Thus all the processes of bacillar infection, inhalation, inoculation, produce the same result as the inoculation of the tuberculous substance. They give rise to miliary and to caseous tubercles, equally with spontaneous tuberculosis, and there is not even an exception for refractory animals, as dogs, cats, etc. Two hundred and seven experiments of Koch prove this general law, viz: *bacillemia is equivalent to tuberculosis*.

It may be objected that other parasites may produce similar effects, viz; a tuberculosis; but it must be observed that everywhere and always, in true tuberculosis, whatever its origin may be, the bacillus is always found, and never in the pseudo-tubercles. It can then be said that the *tuberculous bacillus is in the same correspondence to tuberculosis as the carbuncular bacteria is to anthrax*.

MONSTROSITIES.

By C. C. LYFORD, M.D., C.M., B.S., V.S., President Northwestern Veterinary College.

The following notes and accompanying cuts are representatives of specimens donated to the Northwestern Veterinary College during the past year:

FIG. 1.—A lamb of the monocephalian variety (*Cormo Melodidymi*), was donated to the college museum by C. R. Mason, student.

The vertebral column is double posteriorly from atlas, while the abdominal walls are continuous as far down as the umbilicus, which is single. The head is perfectly normal in appearance, though considerably enlarged in proportion to the body, as the entire foetus weighs only two and three-quarter pounds.



FIGURE 1.

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Figure 2 represents a monster calf (*Pygodidymus Aversus*), which is so exactly united at the posterior dorsal region as to make the vertebral columns appear as almost continuous.



FIGURE 2.

Head No. 1, with fore extremities A and B, correspond to pelvis, tail and extremities C, I, E.

Head No. 2, with fore extremities G and H, correspond to hind extremities D, F and J—the tail being absent, as also the sacrum, pelvis bones and lumbar vertebræ.

Luckily head No. 1 was presented with fore legs A and B, so so that D was easily brought forward under B, after which, traction being made on A, B and D, the foetus was quite easily removed. Had No. 2 been presented instead of No. 1, it is easy to see what difficulties must have followed, by pelvis and extremities C, E and I, as well as F, endeavoring to pass with thorax and fore extremities G and H, through the pelvic cavity of the mother.

The weight of the monster was 132 lbs., while the mother was only a moderate sized grade heifer, two years old. This being

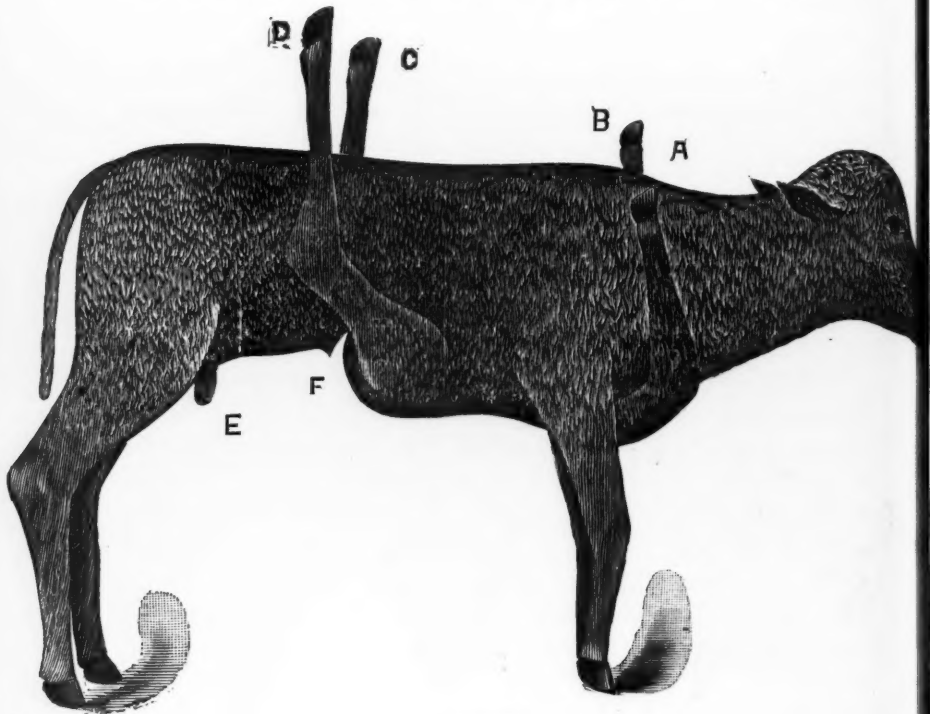


FIGURE 3.

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the first calf, left her rather ill-disposed for several days after delivery. The foetus was dead at time of delivery, head No. 1 having been noticed protruding for about twelve hours prior to assistance being given.

Figure 3 represents a mounted specimen shipped here from Iowa, so that its history is unknown. It corresponds exactly to the *Emprosthomelophorus Octipes* (*Fleming's Veterinary Obstetrics*), having four supernumerary limbs beneath the thorax. There is no vertebral column corresponding to accessory limbs A, B, C and D, though scapulæ overlap the cariniform cartilage and anterior costal cartilages, while the pelvic bones are applied to and overlap the xiphoid and cartilages of the posterior true ribs. E, scrotum, and F, penis.

All three monstrosities, respectively figures 1, 2 and 3, belong to the male gender.

Besides those already noticed, two other monstrosities have been donated. One, a four-legged duck, with the two supernumerary ones having origin from the caudal extremity; the other a four-legged chicken, with the two accessory limbs having their origin beneath the wings; otherwise normal.

EDITORIAL.

THE ANNUAL MEETING OF THE UNITED STATES VETERINARY MEDICAL ASSOCIATION.

Since the semi-annual meeting of the United States Veterinary Medical Association, which was held last March in Boston, we have received from various parts of the country many inquiries asking in what city the place of meeting would this time be—where would the anniversary reunion be celebrated?—was it as usual in the East, in New York City? or was at last the Association going to start out of her routine and go traveling West? Up to a few days we were unable to give a definite answer; our wishes only could be communicated, with the fear which we entertained that strong, and to some very apparently good, reasons might influence the members of the Comitia Minora, and

again have the meeting in New York. It is with much gratification that in this issue we can settle the question and make it known, as will be seen by the report of the Comitia Minora, which we publish, that the next annual meeting of the Association will take place on the regular day of September in Cincinnati.

"You will not have a quorum!"

These were the conclusions of the minority when the question was put to a vote.

If this is to be true remains for the Association to decide. If there is not enough professional ambition amongst the forty or fifty members of the Association who belong to the East; if the apathy characteristic of the American veterinarians cannot be shaken enough to make New York, Massachusetts, Pennsylvania, New Jersey and the other States go for once towards their sister States of the West; if there are not enough interests at stake; if the officers of the Association, the members of the various committees, that on Education, on Diseases, on Prizes, if all remain satisfied with the selecting of the place and nothing more, and quietly wait for the day when a few enthusiasts will start for Cincinnati; oh, then if—if—of course there will be no quorum; there will be no meeting; there will be a great failure, a great joy for those who are enemies of the Association—and the next best thing that the U. S. V. Med. Association will have to do will be to die, to cease her labors as unworthy of being a national institution.

But, on the contrary, if, as we hope, the majority of the members will go, leaving aside personal interests, following the general professional welfare; if the President and the Secretary of the Association will fully appreciate their duties and what they ought to do; if the Chairmen of the various committees will attend to their offices and bring reports of their departments; if the various States Associations will send delegates, we see no reason why a quorum should not be obtained; nor why the meeting should not be a success. What is needed is a little more energy and a little more professional love, and perhaps a little less self interest. We know it is hard for some to leave a prac-

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tice for four or five days ; perhaps, besides the loss resulting from this, a question of expenses is to be considered ; but after all this happens so seldom, it is so unusual for us to go off at such a distance, that it ought to be a sufficient reason for all of us to go, especially when this is to be so handsomely repaid by the union of a large number of the veterinarians of the country, and the great advantage that all of us, and, above all, the United States Veterinary Medical Association, will gain by it.

DR. F. S. BILLINGS GOES TO EUROPE.

We have learned of the contemplated departure to Europe of our friend and colleague Dr. F. S. Billings. We understand the object of the trip is to possess himself of the new discoveries made in pathological investigations since he left Berlin, by working as an assistant in several of the laboratories of France and Germany. Since his return to America Dr. B. has not remained idle, and the many writings that have been published by him, whether with satisfactory results or not, with more or less wisdom might be said, are in our estimation an example that many of our friends on this continent might, if not entirely imitate, at least to some extent take pattern after. Few amongst us have written as much in years as Dr. Billings has done in months, and though in some instances he has overreached the object he had in view, no one will fail to appreciate that he ever had but one purpose, viz : *the elevation of his profession.*

SANITARY STATEMENTS.

The crowded condition of this issue prevents us from publishing the results of the investigations we have inaugurated on this subject for the present. We will do so in our next number, and in the meantime call again upon some of our friends who have not yet answered previous requests.

OUR REGISTER OF REGULAR GRADUATES.

In undertaking in recent issues the publication of the regular graduates practicing in the United States, we have not ignored

the difficult task before us—for though we are acquainted with a great many, we know well how many obstacles would lie in the way of our obtaining the names of all, or even of nearly all those that are graduated. To try to avoid what some might consider as a personal objection and to do justice to all as much as we could, we first took what was considered the best way, and directed ourselves to the principals of the veterinary colleges that we knew of in North America, and thanks to this, we have been able, including this issue, to present the names of the alumni of three veterinary institutions. If we should stop here, no doubt our register would be very incomplete, and we hope our readers will kindly combine to assist us. Agricultural schools to which veterinary departments are attached, like Cornell, like Amherst and others; medical colleges or universities, like Pennsylvania and Harvard, would do us a great favor and assist us in doing justice to their alumni by sending us the names which they know ought to be published. But not only that, every individual practitioner must feel in duty bound to send us the names and titles of those whom they may know to be holders of diplomas, especially if the possessor has obtained his degree from a foreign school. It is not only American graduates that we propose to publish, but as fully as we can veterinarians practicing in the United States. We need not say that our thanks are hereby sincerely tendered to all those who may see fit to help us in our work. All of us are interested in it.

REGISTER OF GRADUATES OF VETERINARY MEDICINE.

Continued from page 180.

ALUMNI OF THE ONTARIO VETERINARY COLLEGE.

(Copied from the advance sheets of the Announcement of the Ontario Veterinary College, kindly furnished us by Principal A. Smith, V.S.)

Names in italics indicate, so far as we know, practitioners in the United States.

Ackrell, H. D.	.....Belleville	.....1879
Armstrong, J.	.....Bayfield	.....1879
Alexander, James Graham	.....Sandhill	.....1874
Anderson, James	.....Drumquin	.....1875
Allan, Thomas A.	.....Brockville	.....1874
Atkinson, <i>Vicars Thomas</i>	.....Milwaukee, Wis., U.S.	.....1875

Aiken
Anders
Arms
Anders
Ashe,
Austin
Adair
Addis
Arms
Badger
Baten
Bartr
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Bell, C
Bell, A
Black
Butch
Bates,
Bond,
Baird,
Brady
Brack
Burns,
Baker,
Bryce,
Brent
Byers,
Burnet
Bailey
Beatty
Brodie
Brooks
Boswel
Burt, V
Burt, J
Butler,
Bell, W
Blanch
Bornen
Brodie,
Burt, C
Berry,
Blackal
Blank,
Bonen,
Calder,
Carley,
Cather,

Aikenhead, John.....	Clinton	1875
Anderson, William.....	Elora	1875
Armstrong, Robert J.....	Markham.....	1872
Anderson, S. G.....	Tottenham.....	1878
<i>Ashe, T.</i>	Brooklyn, N. Y., U.S.....	1881
Austin, W. B.....	Waterford.....	1881
<i>Adair, H. B.</i>	Paris, Ky., U.S.....	1883
Addison, James	Newmarket.....	1883
<i>Armstrong, —</i>	Au Sable, Mich., U.S.....	1883
Badgerow, A. H.....	Uxbridge.....	1881
Bateman, D.....	Port Perry.....	1879
<i>Bartram, E. W.</i>	Ovid, Mich., U.S.....	1879
<i>Bartram, E. S.</i>	Lainsbury, Minn., U.S.....	1881
<i>Bell, G. W.</i>	Oswego, N. Y., U.S.....	1880
Bell, A.....	Sharpton.....	1880
Blackwell, E.....	Glencoe.....	1879
Butcher, H.....	Trafalgar	1879
<i>Bates, G. W.</i>	Wellington, Mo., U.S.....	1877
<i>Bond, John P.</i>	Chicago, Ill., U.S.....	1873
Baird, Robert.....	Brucefield	1873
Brady, William.....	Tilsonburg.....	1873
<i>Brackin, J. A.</i>	Pittsfield, Mass., U.S.....	1873
Burns, William.....	King.....	1872
Baker, —.....	Galt.....	1869
<i>Bryce, John</i>	Erie, Penn., U.S.....	1870
<i>Brenton, S.</i>	Jackson, Mich., U.S.....	1880
Byers, W. J.....	Lloydtown.....	1879
Burnett, J.....	London	1880
Bailey, J.....	Barrie.....	1871
Beatty, John.....	Cobourg.....	1876
Brodie, Charles J.....	Bloomington.....	1875
<i>Brooks, F.</i>	Rochester, N. Y., U.S.....	1881
Boswell, Walter G.....	Sydenham, England.....	1875
Burt, W.....	Simcoe.....	1880
<i>Burt, D.</i>	Fargo, Dak., U.S.....	1881
<i>Butler, J. S.</i>	Grand Rapids, Mich., U.S.....	1881
Bell, W. S.....	Kars.....	1882
<i>Blanchard, L. D.</i>	Mt. Eaton, Ohio, U.S.....	1882
<i>Borneman, H. G.</i>	Clayton, Penn., U.S.....	1882
<i>Brodie, J. L.</i>	New London, Iowa, U.S.....	1882
Burt, G. W.....	Lynn Valley.....	1882
<i>Berry, Vinton A.</i>	Marion, Ohio, U.S.....	1883
Blackall, Jas. E.....	Birr	1883
<i>Blank, Cyrus J.</i>	Coopersburg, Penn., U.S.....	1883
<i>Bowen, E. E.</i>	Tyre, N. Y., U.S.....	1883
<i>Calder, J. A.</i>	Peoria, Ill., U.S.....	1881
Carley, L.....	Laspay.....	1881
Cather, Lavin.....	Lindsay.....	1867

Cain, W.	Cheltenham.....	1880
Cowan, William.....	Galt.....	1868
Coleman, A. O. F.....	Ottawa.....	1869
Coates, John.....	Barrie.....	1867
Cæsar, J.....	Port Hope.....	1871
Churchill, T.....	Seaforth.....	1871
Churchill, William.....	Goderich.....	1871
Colcleugh, William.....	Mount Forest.....	1871
Coulter, G.....	Weston.....	1880
Colsson, P. Z.....	Mobile, Ala., U.S.....	1880
<i>Craig, John</i>	Hamilton.....	1870
Cæsar, James.....	Campbell Cross.....	1870
<i>Crane, C. C.</i>	Sharon Centre, Ohio, U.S.....	1881
<i>Cleaver, K. H.</i>	Allentown, Pa., U.S.....	1879
<i>Coppis, G. W.</i>	Madisonburg, Ohio, U.S.....	1879
Carson, Thomas L.....	London.....	1875
<i>Charlesworth, James</i>	Flint, Mich., U.S.....	1873
<i>Chase, T. P.</i>	Ashland, Ohio, U.S.....	1878
Cook, Harland.....	Grahamsville.....	1873
Cook, Charles H.....	Cobourg.....	1872
<i>Cook, Andrew S.</i>	Binghamton, N.Y., U.S.....	1872
Coleman, A. R.....	Port Dover.....	1876
Campbell, Archibald M.....	Varna.....	1872
Churchill, James.....	Clinton.....	1874
<i>Campbell, Frank A.</i>	Canandaigua, N.Y., U.S.....	1874
Cummings, —.....	Mitchell.....	1870
<i>Claris, J. T.</i>	Buffalo, N.Y., U.S.....	1882
Clark, R. C.....	Wellesley.....	1882
<i>Cook, J. N.</i>	Atlanta, Georgia, U.S.....	1882
Cottam, S. J.....	Edinburgh, Scotland.....	1882
<i>Cotton, T. Bent.</i>	Mount Vernon, Ohio, U.S.....	1882
Carter, R. W.....	Guelph.....	1883
Courtenay, E. St. George.....	Waterford, Ireland.....	1883
Clement, H. H.....	Michigan.....	1883
<i>Crane, J. B.</i>	Sharon Center, Ohio, U.S.....	1883
Daley, F.....	Georgina.....	1881
<i>De Vore, D. L.</i>	Red Oak, Ohio, U.S.....	1881
<i>Dell, J. A.</i>	Saline, Mich., U.S.....	1881
<i>Detlor, Albert</i>	New York, N.Y., U.S.....	1881
Douglas, Albert C.....	Belleville.....	1880
Deacon, J. R.....	Belmont.....	1878
<i>Derr, F. W.</i>	Wooster, Ohio, U.S.....	1878
Duncan, John Thomas.....	Goderich.....	1872
Dean, Joseph.....	Peterborough.....	1872
<i>Doan, Henry C.</i>	Iowa, U.S.....	1876
<i>Drinkwater, Albert</i>	Rochester, N.Y., U.S.....	1874
Dunbar, William Alexander.....	Florence.....	1876
<i>Dallimore, George A.</i>	Minn., U.S.....	1879

Dumphreys
 Dryden,
 Dickens
 Dunn, C
 Elliott,
 Elliott,
Elliott,
 Elder, J
 Evans,
 Evelyn,
 Evelyn, I
 Fisher,
Foelker,
 Foster,
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 Frink, J
 Fowler,
 Fry, Jac
Fair, V
 Faskin,
 Falls, G
Folsette,
Fretz,
 Ferguso
 Fisher,
 Forbes,
Fertling,
 Fisher,
Goff, F
 Gemme
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 Grant,
Green,
 Grensid
 Gibb, V
 Gibson,
 Graham
 Grange,
 Garbutt
 Golden,
Gowlan,
 Gunn, A
Gustin,
Gouldin,
 Hecken
 Hammi
 Harding
 Hamilt

.....1880	<i>Dumphy, J.</i>	Jackson, Mich., U.S.....	1880
.....1868	Dryden, W. A.....	Tavistock.....	1882
.....1869	Dickenson, S. S.....	Zion.....	1883
.....1867	Dunn, Chas. M.....	Hamilton.....	1883
.....1871	Elliott, William.....	Elora.....	1866
.....1871	Elliott, Charles.....	St. Catharines.....	1870
.....1871	<i>Elliott, John</i>	Toledo, Ohio, U.S.....	1871
.....1871	Elder, James.....	Rodgerville.....	1875
.....1880	Evans, R.....	Tullamore.....	1871
.....1880	Evely, M.....	St. Thomas.....	1869
.....1870	Evely, Henry.....	St. Thomas.....	1874
.....1870	Fisher, Thomas.....	Georgetown.....	1879
.....1881	<i>Foelker, Samuel</i>	Allentown, Pa., U.S.....	1879
.....1879	Foster, Newton.....	Belleville.....	1879
.....1879	<i>French, O. B.</i>	Bloomfield, N. Y., U.S.....	1879
.....1875	Frink, James.....	St. John's, N.B.....	1879
.....1873	Fowler, James.....	Seaforth.....	1872
.....1878	Fry, Jacob.....	Dunnville.....	1872
.....1873	<i>Fair, William Cooper</i>	Cleveland, Ohio, U.S.....	1871
.....1872	Faskin, John W.....	Paris.....	1874
.....1872	Falls, George.....	Ottawa.....	1878
.....1876	<i>Folsetter, William</i>	Evansville, Ind., U.S.....	1874
.....1872	<i>Fretz, J. B.</i>	Pennsylvania, U.S.....	1880
.....1874	Ferguson, J.....	Toronto.....	1881
.....1874	Fisher, J. W.....	Baillieboro.....	1883
.....1870	Forbes, E. R.....	Toronto.....	1883
.....1882	<i>Ferling, G. G.</i>	Indianapolis, Ind., U.S.....	1883
.....1882	Fisher, Fred.....	Baillieboro.....	1883
.....1882	<i>Goff, F. L.</i>	Ohio, U.S.....	1880
.....1882	Gemmell, J. E.....	Toronto.....	1879
.....1882	Gemmell, Robert.....	Etobicoke.....	1868
.....1883	Grant, Neil.....	Sombra.....	1879
.....1883	<i>Green, C. S.</i>	Richmond, Ill., U.S.....	1879
.....1883	Grenside, T. C.....	Guelph.....	1879
.....1883	Gibb, William.....	St. Mary's.....	1876
.....1881	Gibson, James.....	Walkerton.....	1871
.....1881	Graham, James.....	Manitoba.....	1872
.....1881	Grange, C. A. A.....	Guelph.....	1873
.....1881	Garbutt, William.....	Co. Wellington.....	1872
.....1880	Golden, E.....	Flora.....	1876
.....1878	<i>Gowland, George</i>	Seneca Falls, N. Y., U.S.....	1865
.....1878	Gunn, Andrew.....	Beaverton.....	1876
.....1872	<i>Gustin, C. M.</i>	Woster, N. Y., U.S.....	1881
.....1872	<i>Goulding, F.</i>	Richmond, Mich., U.S.....	1883
.....1876	Heckenberger, J.....	Catasauga.....	1879
.....1874	Hammil, T. J.....	Keenansville.....	1879
.....1876	Harding, R. A.....	Kingston, Jamaica.....	1877
.....1879	Hamilton, H.....	Toronto.....	1877

<i>Howell, C.</i>	Iowa, U.S.	1880
<i>Hawley, H. Y.</i>	Adrian, Mich., U.S.	1880
Harrison, Edward.....	Milton.....	1867
High, M. L.....	Bayham.....	1877
Hilcock, Thomas.....	Uxbridge.....	1872
Honey, William.....	Mitchell.....	1872
Hamilton, Daniel.....	Harriston.....	1872
Holmes, Benjamin.....	Erin.....	1873
Hope, Thomas.....	Berlin.....	1869
Hopkins, H.....	Green River.....	1877
<i>Howard, R. D.</i>	Castile, N.Y., U.S.	1875
Hawkins, Joseph.....	Paris.....	1871
<i>Harthill, A.</i>	Louisville, Ky., U.S.	1870
<i>Hagyard, J. R.</i>	Lexington, Ky., U.S.	1875
Hinman, W. H.....	Winnipeg.....	1875
<i>Hood, T. A.</i>	Ogdensburg, N.Y., U.S.	1875
<i>Hutchings, Robert Charles.</i>	Watertown, N.Y., U.S.	1871
<i>Henderson, Matthew J.</i>	Syracuse, N.Y., U.S.	1874
Hughes, James Spalding.....	Schomberg.....	1874
Hodgson, Thomas.....	Toronto.....	1874
<i>Hagyard, T.</i>	Lexington, Ky., U.S.	1878
Hand, W.....	Alliston.....	1878
<i>Heckenburger, H.</i>	Catasauga, Pa., U.S.	1878
<i>Hinman, G. P.</i>	Colborne, Pa., U. S.	1878
<i>Humphries, J.</i>	Lockhaven, P.A., U.S.	1878
<i>Honiford, S. L.</i>	Pittsfield, Mass., U.S.	1881
<i>Huntsberger, W.</i>	East Union, Ohio, U.S.	1881
Hall, G. H.....	Chatham.....	1882
Hodgins, J.....	London.....	1882
<i>Howe, Wm. R.</i>	Cleveland, Ohio, U.S.	1883
Jaffrey, John.....	Woodbridge.....	1874
Jex, W.....	Brantford.....	1878
Johnston, John.....	Teeswater.....	1879
<i>Johnson, J. D.</i>	Wahoo, Neb., U.S.	1882
<i>James, V. L.</i>	Springfield, N.Y., U.S.	1883
James, Harry F.....	Ottawa.....	1833
Jaffery, Geo. P.....	Toronto.....	1883
Johnston, Jas.....	Dundee, Scotland.....	1883
Jones, Robt. A.....	Simcoe.....	1883
Jopling, Wm.....	Parkhill.....	1883
Kempshell, George.....	Ingersoll.....	1866
Kenning, E.....	Elmira.....	1877
Kenning, Richard W.....	Pembroke.....	1872
Kidd, William Charles.....	Listowel.....	1871
<i>Keeler, J. R.</i>	Harleyville, Pa., U.S.	1883
Kerr, Thos.....	Wingham.....	1883
Kidd, W. F.....	Cookstown.....	1883
<i>Langtry, W.</i>	Fort Wayne, Ind., U.S.	1877

Livingsto
 Lloyd, T
 Lipsett, J
 Little, Ch
 Loughma
 Labron, V
 Lount, G
Langford
 Logan, A
 Lawson, J
 Lyons, W
 Massie, J
 Matthews
 Matthews
Meredith,
Miller, J.
Milnes, J.
Martin, J.
 Miller, D
Morrison,
 Mayhew,
 Murcott, '
Moor, A.
 Murray, C
Maguire,
 Marshall,
 McDonag
 McEvan..
McNally,
 McNee, A
 McDonald
 McIntosh,
 McConnel
 McNaught
McLeod, J.
 McIntosh,
McKenny,
McIntosh,
 McFadden
McCormac,
 McKenny,
McKillop,
 McCollum
 McKerrack
 McDonald
 McInally,
 McLain, W

.....1880	Livingston, Archibald M.....	Sarnia.....	1872
.....1880	Lloyd, T.....	Newmarket.....	1870
.....1867	Lipsett, Francis Wesley.....	Manitoba.....	1874
.....1877	Little, Charles.....	Winnipeg.....	1872
.....1872	Loughman, J.....	Montreal.....	1880
.....1872	Labron, W. A.....	Perth.....	1881
.....1872	Lount, G. F.....	Chicago.....	1881
.....1873	Langford, W. E.....	Indiana, U.S.....	1881
.....1869	Logan, A.....	London.....	1881
.....1877	Lawson, S.....	Acton.....	1882
.....1875	Lyons, W. G.....	Cheltenham.....	1882
.....1871	Massie, James.....	Smith's Falls.....	1879
.....1870	Matthews, T. W.....	Toronto.....	1879
.....1875	Matthews, C.....	Brougham.....	1881
.....1875	Matthews, A. D.....	Brougham.....	1881
.....1875	Meredith, Thomas.....	Jamestown, N.Y., U.S.....	1880
.....1871	Miller, Joseph.....	Seville, Ohio, U.S.....	1879
.....1874	Milnes, John C.....	Cedar Rapids, Mich., U.S.....	1879
.....1874	Martin, James.....	Lockport, N.Y., U.S.....	1872
.....1874	Miller, David.....	Exeter.....	1873
.....1878	Morrison, T. A.....	La Salle, N.Y., U.S.....	1876
.....1878	Mayhew, Edward.....	Sandhill.....	1870
.....1878	Murcott, T. H.....	Arnprior.....	1875
.....1878	Moor, A.....	Mansfield, Ohio, U.S.....	1878
.....1878	Murray, George.....	Ridgetown.....	1883
.....1881	Maguire, A.....	Joliett, Ill., U.S.....	1881
.....1881	Marshall, H. G.....	Dungannon, Ireland.....	1883
.....1882	McDonagh, T.....	Goderich.....	1879
.....1882	McEvan.....	Cobourg.....	
.....1883	McNally, M.....	Houston, Texas, U.S.....	1879
.....1874	McNee, Archibald.....	Winnipeg.....	1867
.....1878	McDonald, John.....	Ingersoll.....	1869
.....1879	McIntosh, W. D.....	Kingston.....	1869
.....1882	McConnell, Thomas.....	Brampton.....	1872
.....1883	McNaught, David.....	Seaforth.....	1872
.....1833	McLeod, Alexander.....	Jackson, Mich., U.S.....	1872
.....1883	McIntosh, David.....	Kincardine.....	1872
.....1883	McKenny, Richard.....	Michigan, U.S.....	1873
.....1883	McIntosh, James.....	Oswego, N.Y., U.S.....	1874
.....1883	McFadden, D. H.....	Allenford.....	1880
.....1866	McCormack, W. J.....	Detroit, Mich., U.S.....	1879
.....1877	McKenny, J.....	Picton.....	1874
.....1872	McKillop, M. H.....	Chicago, Ill., U.S.....	1877
.....1871	McCollum, Alexander.....	Stratford.....	1875
.....1883	McKerracher, J.....	Highgate.....	1878
.....1883	McDonald, Alexander.....	Cobourg.....	1882
.....1883	McInally, J. G.....	Lyn Valley.....	1882
.....1877	McLain, W.....	Nanticoke.....	1882

<i>McLean, Chas. C.</i>	Meadville, Pa., U.S.	1883
McElory, H.....	Orillia.....	1881
McEvers, Geo.....	Campbellford.....	1877
Newton, R. W.....	Belleville.....	1877
Nixon, Frederick.....	Fergus.....	1874
Nott, John.....	Brussels.....	1873
<i>Newton, J. V.</i>	Toledo, Ohio, U.S.....	1878
Newton, John.....	Weston.....	1883
<i>Ovens, H.</i>	Bay City, Mich., U.S.....	1881
Oliver, E. C.....	Claude.....	1879
Otwell, S.....	Glasgow.....	1878
O'Leary, Louis.....	Duffin's Creek.....	1873
O'Neil, J. D.....	London.....	1873
Parkins, W.....	Beeton.....	1882
<i>Prentice, E.</i>	Chicago, Ill., U.S.....	1879
Palmer, S. P.....	Toronto.....	1878
<i>Pierce, B. A.</i>	Creston, Ill., U.S.....	1878
<i>Page, B. B.</i>	Illinois, U.S.....	1880
Powers, W.....	Lindsay.....	1879
Preston, W.....	Concord.....	1881
<i>Pierce, C. A.</i>	Creston, Ill., U.S.....	1882
Porteous, A.....	Simcoe.....	1882
<i>Price, J.</i>	Line, Lexington, Pa., U.S.....	1882
Perdue, John.....	Orangeville.....	1883
Perdue, John N.....	Wingham.....	1883
Plank, M. W.....	Uxbridge.....	1883
<i>Poucher, M. M.</i>	Oswego, N. Y., U.S.....	1883
<i>Queen, I. J.</i>	Salineville, Ohio, U.S.....	1883
Quinn, John F.....	Edmonton.....	1883
Rose, W.....	Durham.....	1879
<i>Rose, W.</i>	Grand Rapids, Mich., U.S.....	1881
<i>Rutherford, J. G.</i>	Ohio, U.S.....	1879
Robinson, Robert.....	Tullamore.....	1866
Ross, J. R.....	Lucknow.....	1876
Richardson, Benjamin.....	Simcoe.....	1870
Rogers, David.....	Aurora.....	1873
Rogers, E. S.....	Bradford.....	1877
Reid, John.....	Napanee.....	1872
Robinson, William A.....	Galt.....	1872
Richardson, John James.....	Meaford.....	1871
Rathwell, Isaac.....	Verna.....	1874
Richardson, John C.....	Sunderland.....	1874
<i>Robson, G. L.</i>	Penn Yan, N. Y., U.S.....	1875
Ridd, William.....	Wingham.....	1875
Riddell, R.....	Cobourg.....	1880
<i>Reed, J. Hugo.</i>	Georgetown, Pa., U.S.....	1882
Row, Wm. B.....	Rond Eau.....	1883
<i>Reed, S. G.</i>	Ruyschlvania, Ohio, U.S.....	1883

Shalliol, P.
 Smith, C. P.
 Stevenson, J.
 Stephens, J.
Somerville,
 Sweetapple,
Severcool, P.
 Sanderson,
Sutherland,
 Stubbs, Wil
 Sterling, W
Somerville,
 Smith, Hen
Stalker, M.
 Standish, J
 Stewart, W
 Stovel, D.
 Sweet, Wil
 Skirk, And
 Smith, Joh
 Spiers, Joh
 Swinburne
Sutterby, I.
Smeall, A.
Smithers, I.
 Stevenson,
Springer, I.
 Shaw, W.
Somerville,
 Steele, W.
 Sterling, V
 Scanlon, W
 Smith, C.
Sutherland
Swingley, I.
Sallade, Jo
Schoonmah
Shimer, A
Stowe, C.
 Sine, M. V
 Smith, Jas
Stallman,
 Stewart, J
Stewart, I.
Stimpson,
Taylor, J.
 Taylor, C.
 Ten Eyck,

.....1883	<i>Shalliol, P.</i>	Ohio, U.S.....	1880
.....1881	Smith, C. P.....	St. Mary's.....	1880
.....1877	Stevenson, P.....	Aurora.....	1880
.....1877	Stephens, J.....	Collingwood.....	1879
.....1874	<i>Somerville, Robert</i>	Buffalo, N. Y., U.S.....	1877
.....1873	Sweetapple, C. H.....	Brooklyn.....	1869
.....1878	<i>Severcool, P.</i>	Ohio, U.S.....	1880
.....1883	Sanderson, J.....	Richmond Hill.....	1868
.....1881	<i>Sutherland, Mr.</i>	Saginaw, Mich., U.S.....	1869
.....1879	Stubbs, William.....	Orangeville.....	1869
.....1878	Sterling, William.....	Bradford.....	1874
.....1873	<i>Somerville, William</i>	Buffalo, N. Y., U.S.....	1874
.....1873	Smith, Henry.....	Whitechurch.....	1873
.....1882	<i>Stalker, M.</i>	Ames, Iowa, U.S.....	1877
.....1879	Standish, John.....	Walkerton.....	1876
.....1878	Stewart, W. W.....	Sandhill.....	1876
.....1878	Stovel, D.....	Mount Forest.....	1877
.....1880	Sweet, William.....	Exeter.....	1873
.....1879	Skirk, Andrew.....	Port Colborne.....	1872
.....1881	Smith, John Francis.....	Simcoe.....	1872
.....1882	Spiers, John.....	Manitoba.....	1871
.....1882	Swinburne, George.....	Montreal.....	1875
.....1882	<i>Sutterby, H.</i>	Batavia, N. Y., U.S.....	1878
.....1883	<i>Smeall, A. N.</i>	Seville, Ohio, U.S.....	1878
.....1883	<i>Smithers, P.</i>	St. Louis, Mo., U.S.....	1878
.....1883	Stevenson, A. K.....	Cobourg.....	1878
.....1883	<i>Springer, U.</i>	Tipston, Iowa, U.S.....	1880
.....1883	Shaw, W.....	London.....	1881
.....1883	<i>Somerville, W. J.</i>	Buffalo, N. Y., U.S.....	1881
.....1879	Steele, W.....	Topping.....	1881
.....1881	Sterling, W.....	New Hamburg.....	1881
.....1879	Scanlon, W. T.....	London.....	1882
.....1866	<i>Smith, C. L.</i>	Silver Cliff, Col., U.S.....	1882
.....1676	<i>Sutherland, H. H.</i>	St. Francisville, Ill., U.S.....	1882
.....1870	<i>Swingley, B. F.</i>	Oregon, Ill., U.S.....	1882
.....1873	<i>Sallade, Jas. W.</i>	Reading, Pa., U.S.....	1883
.....1877	<i>Schoonmaker, J. H.</i>	New York, U.S.....	1883
.....1872	<i>Shimer, A. S.</i>	Shimersville, Pa., U.S.....	1883
.....1872	<i>Stowe, C. W.</i>	Detroit, Mich., U.S.....	1883
.....1871	Sine, M. W.....	Sterling.....	1883
.....1874	Smith, Jas. F.....	Pt. Ryer.....	1883
.....1874	<i>Stallman, Jacob</i>	Rochester, N. Y., U.S.....	1883
.....1875	Stewart, John G.....	Brantford.....	1883
.....1875	<i>Stewart, Robt. W.</i>	Mt. Victory, Ohio, U.S.....	1883
.....1880	<i>Stimpson, Geo. W.</i>	Macinaw, Mich., U.S.....	1883
.....1882	<i>Taylor, J.</i>	Toledo, Ohio, U.S.....	1880
.....1883	Taylor, C.....	Hornby.....	1876
.....1883	Ten Eyck, Merritt Harriss.....	Thorold.....	1874

Tennent, E.....	Birr.....	1876
Thompson, A.....	Hamilton.....	1871
Thomas, G. W.....	Brantford.....	1881
Thomas, G. W.....	Owen Sound.....	1868
Thompson, Samuel J.....	Brantford.....	1872
<i>Thompson, Warwick M.</i>	Denver, Col., U.S.....	1872
Tenant, James Harkett.....	London.....	1874
Theobald, G.....	Teeswater.....	1878
Tanner, A. A.....	Drayton.....	1882
Tanner, W. J.....	Mount Forest.....	1882
Thomas, F. A.....	Paisley.....	1882
Thompson, A. E.....	Strathroy.....	1883
<i>Thompson, J. B.</i>	New York, U.S.....	1883
Upshall, John.....	Clinton.....	1868
Van Zant, Urias.....	Stouffville.....	1872
Vandervoort, L.....	Trenton.....	1882
Van Zant, Harry.....	Mongolia.....	1883
Way, B.....	Trenton.....	1880
Whitehead, J. P.....	Delaware.....	1880
White, Robert.....	Whitby.....	1879
Walker, W. St. Clair.....	Rice Lake.....	1875
Waistell, E. P.....	Arkona.....	1880
Wilson, J. H.....	London.....	1868
Wells, A. J.....	King.....	1868
<i>Whitehead, Robert Wilson.</i>	Ohio, U. S.....	1874
<i>Welsh, John</i>	Ohio, U. S.....	1874
Woolley, Peter W.....	Aylmer West.....	1872
Wright, J. B.....	Rolchester.....	1876
<i>Wheat, L. E</i>	Scranton, Pa., U.S.....	1878
<i>Waddel, J.</i>	Columbus, Ohio, U.S.....	1878
Wells, E.....	Vittoria.....	1881
White, J.....	Whitby.....	1881
<i>Woodford, C. A.</i>	Rio, Wis., U.S.....	1881
<i>Walker, A. A.</i>	Dakota, U.S.....	1882
<i>Waugh, J. A.</i>	Pittsburgh, Pa., U.S.....	1882
<i>Waugh, W. J.</i>	Pittsburgh, Pa., U.S.....	1882
Wessel, A. E.....	Wooler.....	1882
<i>Whytock, J</i>	Buffalo, N. Y., U.S.....	1882
<i>Wrigglesworth, T.</i>	Duluth, Minn., U.S.....	1882
<i>Whitney Jonathan C.</i>	Allen, Mich., U.S.....	1883
<i>Wight, W. E.</i>	Milbury, Ohio, U.S.....	1883
<i>Woodhull, Ward.</i>	Angola, Ind., U.S.....	1883
Young, Robert.....	Bowmanville.....	1871
Young, Matthew.....	Stayner.....	1873
<i>Young, D.</i>	Abilene, Kan., U.S.....	1880
<i>Yonkerman, D. P.</i>	Cleveland, Ohio, U.S.....	1882

Ardany,
Thorburn
 McMaster
 Cook, A.
 Beattie, I
 Dornkera
McClure,

Anderson
 Ardiel, R
Bailey, C
Blank, G
 Butler, G
 Burt, Da
 Bradley,
Bougham
 Brown, J
 Bogart, S
 Brodie, J
 Cruicksh
Courtena
 Dodge, F
De Witt,
 DeCow,
 Dickey,
 Dodds, V
Charles,
Eisenma
 Graham,
Green, A
Hoffman
 Hackett,
Harthill,
 Hewitt,
Irons, I
 Kincaid,
 Kestell,
 Livingst
 Laidlav
 Mason, I
 Mitchell,
 Murphy,
 McArthur
 Machan,
 Ming, E

GRADUATES OF 1883.

<i>Ardany, F., Jr.</i>	Pittsburg, Pa., U.S.....	1883
<i>Thorburn W. W.</i>	Holt, Michigan, U.S.....	1883
McMaster, David.....	Toronto.....	1883
Cook, A.	Glandford.....	1883
Beattie, Robert.....	Imclanville.....	1883
Dornkeraler, W.....	St. Thomas.....	1883
<i>McClure, S. D.</i>	Sandusky, Ohio, U.S.....	1883

GRADUATES OF 1884.

Anderson, S. G.....	Lambton.....	1884
Ardiel, Robert E.....	London.....	1884
<i>Bailey, Charles M.</i>	Haverhill, Mass., U.S.....	1884
<i>Blank, G. G.</i>	Allentown, Pa., U.S.....	1884
Butler, George W.....	Sterling.....	1884
Burt, Daniel W.....	Hillsburg.....	1884
Bradley, T.....	Gananoque.....	1884
<i>Bougham, M. L.</i>	West Lebanon, Ohio, U.S.....	1884
Brown, James.....	Guelph.....	1884
Bogart, Sam. C.....	Chatham.....	1884
Brodie, James W.....	Almira, Ont.....	1884
Cruickshank, James.....	Heathcote.....	1884
<i>Courtenay, Ed.</i>	Ashland, Ky., U.S.....	1884
<i>Dodge, P. C.</i>	Creston, Ill., U.S.....	1884
<i>De Witt, D. C.</i>	LaFayette, Ind., U.S.....	1884
DeCow, L. C.....	Thamesville.....	1884
Dickey, W. W.	Newtonville.....	1884
Dodds, W. G.....	Orangeville.....	1884
<i>Charles, Elliott.</i>	Madisonburg, Ohio, U.S.....	1884
<i>Eisenman, Albert.</i>	Louisville, Ky., U.S.....	1884
Graham, Orn.....	Port Perry.....	1884
<i>Green, M.</i>	Cesselton, Dakota, U.S.....	1884
<i>Hoffman, Sol. K.</i>	Shoemakerville, Pa., U.S.....	1884
Hackett, John.....	Victoria.....	1884
<i>Harthill, Adam.</i>	Louisville, Ky., U.S.....	1884
Hewitt, Fred.....	Maple.....	1884
<i>Irons, I. B.</i>	Linesville, Pa., U.S.....	1884
Kincaid, W. R.....	London.....	1884
Kestell, Robert H.....	Simcoe.....	1884
Livingston, Niles.....	Jura.....	1884
Laidclaw, W. R.....	Aylmer.....	1884
Mason, R. M.....	Mono Mills.....	1884
Mitchell, W.....	Mono.....	1884
Murphy, Sam.....	Port Hope.....	1884
McArthur, Duncan.....	Ailsa Craig.....	1884
Machan, Wm.....	Mitchell.....	1884
Ming, Ed.	Belleville.....	1884

Nicol, William.....	Beeton.....	1884
Ormsby, John F.....	Ancaster.....	1884
Parker, Frank.....	Maidstone.....	1884
Patterson, N. E.....	Bellantel.....	1884
Reid, J. F.....	Belleville.....	1884
<i>Rowell, H. E.</i>	Albion, N. Y., U.S.....	1884
Reed, Henry G.....	Georgetown.....	1884
Reycraft, Albert.....	Highgate.....	1884
<i>Sutcliffe, John</i>	Brooklyn, N. Y., U.S.....	1884
Steinburg, E. A.....	Frankford.....	1884
Stork, Wm.....	Brampton.....	1884
Sharrard, E.....	Stonfullo.....	1884
Silverthorne, N.....	Summerville.....	1884
Sparham, Andrew.....	Caledonia.....	1884
Tennant, Alfred.....	Birr.....	1884
<i>Tiffany, L. C.</i>	Jacksonville, Ill., U.S.....	1884
Thompson, Charles.....	Zephyrs.....	1884
<i>Wende, John</i>	Mill Grove, N. Y., U.S.....	1884
<i>Weber, S. E.</i>	Greenlane, Pa., U.S.....	1884
Wilson John.....	Wingham.....	1884
Wilson James.....	Wingham.....	1884
Waldron, Harry.....	Ayr.....	1884

REPORTS OF CASES.

LACERATION OF THE PERFORANS TENDON AND THE SESAMOID LIGAMENTS ON THREE LEGS OF A GELDING.

BY RICHARD KAY, D.V.S.

The case was a black gelding, eight years of age, about 850 lbs. weight, light build and clean legs, owned by a gentlemen in the city and kept at Mr. Merklen's riding school, used for riding purposes only, but since last October has only been used sufficient for exercise. About ten days ago the horse became suddenly lame on the off hind leg, when a diagnosis of hock lameness was made. Thinking it to be of a rheumatoid character, local light cantharides blister was applied on the hock, and the animal ordered to be kept quiet in the stall till the effect of the blister had passed. About the fifth day, the parts being all dried, they were washed off with soap and water till no more scabs remained. About this time lameness showed in the fore extremities and gradually got worse till the animal was with difficulty able to rise after being

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HEMIPLE

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down. On account of there being no place to put up slings at that part of the stable, it was recommended to have the horse brought here to the hospital. The owner consented to the removal, which was accomplished with the use of an ambulance, the animal being kept secured on the floor. When after being driven in the stall he was relieved, he made an effort to get up, succeeding first with the front feet, then with the hind legs; but as soon as the weight was thrown on the hind feet, both toes turned up and stood upon the postero-inferior portion of the fetlock. In about half an hour the near fore foot assumed the same condition. A telegram was sent to the owner to get his consent to destroy, which was granted. On post-mortem there was found on the near hind foot a complete breaking down or laceration of the attachment of the flexor perforans on the inferior surface of the os pedis, also laceration of the lateral ligaments and opening of the metatarso-phalangeal articulation. The off hind foot was in a worse condition. The three inferior sesamoid ligaments were torn away from their upper attachment on the sesamoid bones, with the periosteum and a small portion of these bones adhering to the ends of these ligaments. The two lateral ligaments were also detached. The perforans attachment on the os pedis was also torn away, which allowed the foot to form a right angle with the metatarsal bone. On the near fore foot the lesions were similar to that of the hind feet—complete detachment of both flexors of the phalangers. The horse did not appear to suffer much pain. While standing on his feet in the above condition he greedily devoured a feed of oats that had been left in the feed-box of that stall.

EXTRACTS FROM FOREIGN JOURNALS.

HEMIPLEGIA IN A DOG—TREATMENT BY VEGETABLE ALKALOIDS.

By E. HENRY.

This patient had been paralyzed for seven days, and was given up by his owner. He had hemiplegia of the right side. The treatment consisted in the administration of dosimetrical granules of arseniate of strychnia, hyosciamine, valerianate of zinc, and

mono-bromated camphor, given one at a time, every hour, with small doses of buckthorn syrup. The animal began to improve from the second day, and made a complete recovery after a week of treatment.—*Recueil de Medecine Veterinaire*.

[These dosimetrical granules are very easy of administration, and answer the purpose very well in canine pathology. We have used them with great advantage and success, and in fact administer them altogether in our practice with this class of patients.—Ed.]

INOCULATION OF GLANDERS TO DOGS.

By M. LAGUERRIERE.

From a series of experiments made by the author, he reaches the following conclusions:

1st. Equine glanders is transmissible to the dog by hypodermic inoculation.

2d. The inoculated points may cicatrize very rapidly and subsequently give rise, first, to simple wounds, and afterwards to true ulcerations. These same points may again form simple small and persisting wounds, which will ultimately ulcerate.

3d. Most ordinarily the inoculation produces a local trouble, the point of insertion becoming indurated on its circumference, and covered with large granulations, suppurating abundantly and bleeding very readily. The pus dries in thick brownish crusts, more or less adherent. These ulcerations are accompanied, more less, with lesions of the lymphatics.

4th. Local accidents may become generalized.

5th. From the experiments made it is shown that six months and more after a first positive inoculation, a subject has proved refractory to a new inoculation; that after about a year this refractory condition had become exhausted, and upon reinoculation the disease manifested itself by local and even general symptoms; that four months after this second inoculation, immunity again existed; that this immunity against glanders can be communicated to the dog, and that consequently *the animal is no exception to the law of immunity applicable to the prevailing classes of contagious diseases.*

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6th. Some dogs are more or less refractory to the receptivity of glanderous virus.

7th. Negative results must not be accepted in an absolute manner. Positive ones only should be taken into serious consideration. In other words, *a negative cannot prove the non-existence of glanders, but a positive result always does.*—*Ibid.*

A CASE OF GENERALIZED TUBERCULOSIS IN A HEN.

By E. HENRY.

This case is published as an illustration of the possibility of the existence of tuberculosis *in birds*.

Symptoms.—Excessively lean condition; bones protruding through the skin in some parts of the body; comb of normal color and condition; eye dull and partly closed by the membrana nictitans; excessive weakness; feathers nearly falling off; a large tumor under the abdomen.

Post-mortem.—The tumor visible externally extended in the abdomen. It was twice as large as a hen's egg, tuberculous in its nature, and adherent to the terminal portion of the intestines. Its centre had undergone granulo-fatty degeneration, and contained a leaden-colored liquid of an offensive odor. The tumor was formed of smaller ones, tuberculous. The intestinal glands were tuberculous, and of various sizes. Near the kidney there was another large growth. The liver was full of tubercles; the gall bladder also full. The lungs were a mass of tubercles, in a state of mortification. The heart was small, flabby and pale; the pericardium free from serosity. The peritoneum was slightly infiltrated, especially where the large tuberculous tumors were situated.—*Ibid.*

DIAPHRAGMATIC CHOREA.

By M. CAGNY.

The author related before the *Société Centrale de Médecine Vétérinaire* a case of clonic contraction of the diaphragm, to which he gives the above name.

The subject was a gelding, six years of age, which presented

the symptoms of those clonic convulsions, with the peculiarity that they corresponded to the beatings of the heart.

The treatment which he recommends is the administration of valerianate of atropia, in doses of 15 milligrammes, three times a day.—*Ibid.*

ENORMOUS MELANOTIC TUMOR OF THE INGUINAL REGION—REMOVAL—RECOVERY.

By M. ANDRIEU.

The animal was lame in the left hind leg, which was carried in abduction. In the inguinal region of that side was found an ovoid mass, testicular in shape, hard, adherent to the skin, and somewhat painful to the touch. The animal showing by the cicatrices that he had been castrated on both sides, the thought was suggested of a melanotic growth, or possibly a third testicle. In any case, removal was plainly indicated. This was effected, the animal being cast and secured as for the operation of strangulated hernia, and careful dissection being made over the tumor, which dropped out during the manipulations necessary to stop a venous hemorrhage which took place during the operation. The parts were brought together by sutures, and the animal went to work in ten days afterward. The tumor measured 21 centimeters in length and 9 in width. It was surrounded by a fibrous sheath, which divided the mass into two unequal parts. The interior was black, formed of a hard structure, unctuous to the touch, and coloring the fingers. No trace of testicle could be found in its substance.—*Archives Veterinaires.*

TREATMENT OF SPINAL CONGESTION IN THE HORSE.

By MR. LEEELAINOCHE.

This author recognizes three forms of the affection referred to, viz.:

1st. A light form, with less sensibility to ordinary excitation, with dullness, a sleepy condition, and staggering walk; urine normal.

2d. A severe form, with abundant perspiration, a state of

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anxiety, sudden lameness of one leg, until, the animal continuing to walk, becomes unable to stand, and falls to the ground. The urine is often red or blackish.

3d. The paralytic form, with the above symptoms, succeeded by complete loss of motion; urine generally normal.

The first condition subsides easily with a slight bleeding and saline purgatives.

The second requires, before anything else, absolute immobility, with warm applications over the loins, but no counter-irritants. Blisters are too slow in their action, and mercurial preparations useless. Strychnine and its compounds are contra-indicated. Drastics are doubtful in their results.

The third demands revulsive applications, the stronger the better, as frictions of oil of turpentine, with the treatment of the second form.—*Ibid.*

OVARIAN CYST IN A MARE—COMPRESSION AND OBSTRUCTION
OF THE FLOATING COLON—DEATH.

By M. MARCHAEL.

April 25th, a five-year-old mare was taken with colic; appetite diminished; respiration accelerated; nostrils dilated; pulse hard and small; mucous membranes slightly injected; flank irregular and hard on the right side; constipation.

Treated for stercoral colic by purgative; rectal injections, sulphate of eserine and croton oil. She died on the 29th, four days after the attack.

Post-mortem.—The abdominal cavity exhibited, at the extremity of the right horn of the uterus, suspended to the round ligament, a soft, elastic tumor, elliptical in shape, and presenting on its inferior face a dark spot, produced by contact with the abdominal wall. The tumor being opened, was found to contain 11 litres of serous liquid, dark yellow in color, enclosed in a single pouch, covered at its surface with numerous blood-vessels. It weighed 12 kil., 500 grammes (about 13 pounds), and was simply the ovary. It pressed heavily on the floating colon, and caused the closure of that organ.—*Ibid.*

CORRESPONDENCE.

THE NATIONAL VETERINARY MEDICAL ASSOCIATION.

To the Editor of the American Veterinary Review :

It may not be out of place for me to make a few remarks concerning some objections raised by a subscriber to articles published in your journal in the June and July numbers, signed, H. F. James, V.S., St. Louis, Mo.

In the June number he absolutely refuses to have anything to do with any association that was not exclusively of graduates of recognized colleges, and asserts that State associations were tainted with the empirical element, mentioning the names of some distinguished practitioners who signed the conventional call at St. Louis, and whom he objects to. It would be well if the different State societies could be supported according to Mr. James' views. Possibly it could be effected, but the grand aim we are all after would be frustrated without the assistance of many respectable non-graduates, which I believe, nearly, if not all veterinary societies have among them.

There are many ignorant imposters practising veterinary medicine who are entirely unfit to be recognized and incompetent to pass before our State Board of Censors, but on the other hand we admit experienced practitioners who are intelligent and are respected in their community. The admission of members into our State associations is conducted with care and judgment and we admit or reject candidates according to their credentials and examination.

It is impossible for any body of veterinary surgeons, qualified by diploma only, to expect of Congress an act to protect them individually, nor will any law ever be passed without some compromise. It has already been tried and defeated, but by admitting respectable practitioners who have had extensive practice and are educated, into State associations, we will have a stronger hold, and we will there draw our line. Have them registered, as adopted in England, as existing practitioners, and register the graduates as such. Although a graduate myself of one of the first colleges,

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and once of the same opinion as Mr. James, my views have since been changed, and I feel more lenient to self-made Vets., unless they are thoroughly uneducated and unprofessional in their conduct, but I know of many who are well read and have studied considerably and are successful practitioners, who are continually trying to improve themselves and with little encouragement would embrace the advantages of entering a college and completing their studies.

One of my objects in wording a bill as read before the meeting at Ponghkeepsie, was to encourage discussion and stimulate members to assemble and have a petition properly drafted, agreeable to all, which would be settled by a majority of votes, and as the annual convention of the Nat. Vet. Med. Association will be held in Nov. this year, date of which will be published later, I invite the hearty co-operation of all members interested in the welfare of the profession to be present, connected or not with said association, and I take this opportunity of thanking my sincere friends who honored me by electing me to the position I hold as first President of the Nat'l Vety. Med. Association. By publishing the above, if not too lengthy for a space in your journal, it will perhaps clear the minds of some of its readers, and throw some light on those who stand in their own.

Respectfully,

L. V. PLAGEMAN, M.R.C.V.S.

VETERINARY SURGEON WANTED.

The following directed to Dr. Holcombe and Dr. N. H. Paaren, was sent to us recently.

SALINA, KANSAS, —.

DEAR SIR—There could be no better place for a *good* veterinary surgeon to locate than at Salina, Kansas. We have a large amount of fine stock in this county, with a thriving town of 4,000 inhabitants and no veterinary surgeon. Could you assist us in getting a good one. You would confer a favor on him and yours truly,

L. F. PARSONS.

A YOUNG MOTHER.

PROVIDENCE, June 30, '84.

Editor of the American Veterinary Review :

DEAR SIR—The following may be of interest to you and your readers.

Mr. A. G. Reede of Cowhesu, R. I., has a heifer which was born on April the 6th, 1883. She had a calf on May 7th, 1884, when therefore 13 months and a day old. The mother weighed 479 lbs. and the calf when dropped 46.

Yours truly, C. H. PEABODY, D.V.S.

ALUMNI ASSOC'N AM. VETERINARY COLLEGE, }
 TREASURER'S OFFICE, 141 W. 54TH ST., }
 NEW YORK CITY, July 22, 1884. }

Editor American Veterinary Review :

DEAR SIR:—Enclosed you will find a pamphlet on the history of the Alumni of the American Veterinary College, a paper read before the alumni meeting, February, 1884, by W. Horace Hoskine, D.V.S. A resolution was passed to have said paper printed in pamphlet form and furnished to the members of the Association and their friends at a nominal price, which has been fixed at ten cents per copy.

The treasurer has to depend almost entirely upon the generosity of the members for its sale. Copies can be had by applying to the above address.

Hoping that you will give this space in your columns as a means of informing the Association and its friends.

W. J. COATES, M.D., D.V.S.,
 Treasurer Alumni Ass'n of A. V. C.

SOCIETY MEETINGS.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

The Comitia Minora of the United States Veterinary Medical Association held a special meeting at the American Veterinary College, July 2d, at 2 P. M.

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Drs. Miller, L. McLean, Liautard, Burden, Robertson, Coates and Michener were present.—Absent, Drs. Stickney, Lockhart and Hoskins.

President Miller informed the Comitia Minora of its duty,—to name a place of meeting for the Association in September.

Dr. Robertson then moved that our next annual meeting be held in Cincinnati, Ohio. This was seconded by Dr. Burden.

After some remarks on this motion Dr. McLean moved an amendment and desired to substitute New York for Cincinnati. This was seconded by Dr. Michener. Discussion then followed, and the Chair after listening to remarks by all present, proceeded to put the amendment of Dr. McLean to vote. It was lost. By vote on the original motion it was decided to hold the next annual meeting in Cincinnati, Tuesday, Sept. 16th, '84, at 10 A.M.

The Secretary was instructed to ask a full attendance. Besides the number of candidates to be admitted there will be several papers presented to the Association. This meeting promises to be one of the best held for years.

Due notice will be sent to all early in September.

CH. B. MICHENER, *Sec.*

OBITUARY.

L. H. TOURTELLOTTE, D.V.S.

Dr. L. H. Tourtellotte, one of Idaho Springs' most honored and respected young men, met his death on last Wednesday, June 11th, about 1 o'clock P. M., in the Silver mine, on Seaton Mountain.

Dr. Tourtellotte, with Mr. Wm. Ireland, one of his co-owners, was down in the bottom of the shaft, which is about eighty-five feet deep, at work, Mr. Ireland being in the eastern corner of the shaft, with Mr. Tourtellotte on his left, within arms' reach, when a large scale, weighing from one and a half to two tons, gave way, and, in falling, struck Dr. Tourtellotte and Mr. Ireland, throwing them backward. Mr. Ireland, being near the edge of the immense mass, was struck on the left breast by a corner of the scale, receiving slight injuries. He was unconscious for a

short time, and, on recovering from the shock, he found Dr. Tourtellotte entirely buried. Mr. Ireland at once began, with as much energy as his feeble condition would permit, to remove the rocks under which his companion was buried. After he had succeeded in extracting Dr. Tourtellotte he found him to be dead.

Dr. L. H. Tourtellotte was born and raised near La Crosse, Wis. After receiving a liberal education there, he engaged quite successfully for a short time in stock raising, and finally concluded to study veterinary surgery, going to New York City and graduating at the American Veterinary College. About one year and a half ago he came to Denver, where he remained a short time, and from there came to Idaho Springs to superintend the Silver Glance mine, which position he has filled ever since satisfactorily. He was twenty-four years of age and honored and respected by all who knew him, and bore a most enviable reputation here and in every community in which he has lived.

WILLIAM SAUNDERS, D.V.S.

Dr. William Saunders, a veterinary surgeon well known in Boston, Salem, and throughout Essex county, died Wednesday, after a lingering illness, from diabetes. Dr. Saunders was exceedingly skilful in his profession. He never held public office, but was very prominent in the Masonic order, rising to the 32d degree. He was a member of Starr King Lodge, Washington Royal Arch Chapter, the Winslow Lewis Commandery, and the Ancient and Accepted Scottish Rite. He had also been identified with Odd Fellowship for the last forty years, and was a charter member of Fraternity Lodge of Salem, instituted November 18, 1846, and a Patriarch of Naumkeag Encampment. Dr. Saunders, prior to the war, took an active interest in the militia, and rose from the position of Captain of the Salem Mechanic Light Infantry to be Colonel of the old Seventh Regiment, M. V. M. He also held a commission on the Division Staff of Gen. Sutton. He was a member of the Ancient and Honorable Artillery Company, and of the Boston Lancers. He was an estimable citizen, and had a wide circle of friends. Dr. Saunders leaves a widow, to whom he was married a few years ago, but no

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children. He was in the 67th year of his age, having been born in November, 1817, in Dartmouth, England. He came to America at the age of ten years with his father. The latter was also a veterinary surgeon, and found employment with the old Eastern Stage Company.

NEWS AND SUNDRIES.

GLANDERS IN KANSAS.—Glanders exists to some extent in Kansas.

FERTILE MULE.—An Austin paper reports that a mule foaled a colt in that town recently. This is a very rare occurrence.

ANOTHER DISCOVERER OF THE YELLOW FEVER GERM.—Dr. L. Girard, of the Panama Canal Company, has successfully cultivated the yellow fever germ, and has inoculated many animals. He is about to publish his observations.—*Med. Record.*

U. S. QUARANTINE STATIONS.—The United States quarantine yards at Boston and New York are full to overflowing. Portland is empty and Baltimore is very nearly so. The yards at Portland have been thoroughly disinfected, and there is now no danger at that port from foot and mouth disease.—*Breeders' Gazette.*

FOOT AND MOUTH DISEASE IN SWITZERLAND.—Minister Cramer reports from Switzerland that foot and mouth disease among Swiss cattle greatly increased during March. Lung disease has entirely disappeared. Pleuro-pneumonia still prevails in Russia. Foot and mouth disease is prevalent in Alsace-Lorraine, in Baden, and in Italy, though it is not very widespread in either.—*Prairie Farmer.*

LEGISLATION CONCERNING TUBERCULOSIS.—A movement is on foot in Germany, subject to the decision of a commission of medical and veterinary experts, to exclude the meat and milk of tuberculous cattle from the market, experiment having shown that tubercle may be produced in dogs, cats, horses, hogs, and other domestic animals, by mixing tuberculous meat or milk with their food for several consecutive weeks.

three calves; at the second, three; at the third, three, and at the fourth, two. They were all born alive, excepting one. This beats the record as far as I have heard. The cow is above the average as a milk and butter animal, and is considered handsome.—*Country Gentleman*.

TO RECEIVE NO MORE HOGS FROM THE UNITED STATES.—The St. Paul, Minneapolis and Manitoba Railroad Company has been notified by the Collector of Customs at Winnipeg that no hogs could be imported from the United States into Manitoba for breeding purposes, and that the shipment of hogs into Manitoba is forbidden except under regulations providing for their immediate slaughter. For all hogs entered under such regulations a bond must be given as a pledge that they shall be slaughtered immediately.

PROPHYLAXIS OF RABIES.—Professor Sperino finds an analogy in the pathogenesis of syphilis and rabies in the following facts: 1. There is in each of these diseases a long period of incubation after the introduction of the virus; and 2, in many cases in rabies, as in syphilis, there is induration around the point of introduction of the poison, and in a few days an adenopathy arises in the lymphatic glands situated above the infecting part. Attracted by these resemblances, and by others of minor importance, the author tried the effects of mercury in eleven individuals bitten by mad dogs. The cases were seen from three to twelve days after having been bitten. Mercurial frictions were made to the affected limbs until the adenopathy had completely disappeared. None of the persons so treated was attacked with hydrophobia. Though no positive deductions could be made from so small a number of experiments, yet the favorable results obtained in these eleven cases would suggest the utility of further trials of Sperino's method.—*Giornale Italiano delle Malattie Veneree e della Pelle*.

THE EXTERPATION OF THE LUNG.—Among the novel experiments recently tried in Italy, the extirpation of the whole or a part of the lung seems the most remarkable. Fifty-seven animals—sheep, dogs, cats, and others were the subjects—had an entire lung extirpated, and thirty-five recovered. In twenty-three cases

the right lung was removed, and twelve recovered; the left lung was taken away in thirty-four, and there were eighteen recoveries. There were three cases of removal of the upper part of a lung, and one each of removal of the middle and of the lower lobe; all recovered. It is very doubtful if these experiments will ever be imitated on an extended scale, in human beings. Prof. Kronlein, of Zurich, however, in a case of recurring round-celled sarcoma of the sixth rib, recorded in the *Berliner klinische Wochens.*, of March 3, 1884, not only removed a large portion of the wall of the thorax, including the costal pleura, but also resected a portion of the lung which was the seat of a secondary sarcomatous mass. The insignificant bleeding from the lung stopped after bringing the edges of the wound together with the catgut sutures. In one month the patient was discharged cured.—*Phila. Med. News.*

EXCHANGES, ETC., RECEIVED.

FOREIGN.—Veterinarian, Veterinary Journal, Journal de Zootechnie, Presse Veterinaire, Echo Veterinaire, Recueil de Medecine Veterinaire, Archives Veterinaria, Gazette Medicale, Revue Scientifique, Bulletin de l'Academie de Medecine, Clinica Veterinaria, Revue fur Thierheilkunde und Thierzucht, Annales de Bruxelles.

HOME.—Journal of Comparative Medicine, Medical Record, New York Medical Journal, American Agriculturist, Country Gentleman, Prairie Farmer, Breeders' Gazette, National Live Stock Journal, American Cultivator, Scientific American, Turf, Field and Farm, Spirit of the Times, Science.

JOURNALS.—Hearth and Home, Ohio Farmer, Practical Farmer, Home and Farm, &c., &c.

PAMPHLETS.—Manual of Acts and Orders in Council (Manitoba), Report of the Asylum for the Relief of Persons Deprived of the Use of their Reason (Philadelphia), Announcement of the College of Physicians and Surgeons (N. Y.), Announcement of Bellevue Medical College (N. Y.), Announcement New York Post-Graduate Medical School, History of the Alumni Association of the American Veterinary College.

CORRESPONDENCE.—C. H. Peabody, A. A. Holcombe, L. V. Plageman, W. J. Coates, F. S. Billings, N. H. Paaren, C. B. Michener, D. J. Dixon, J. Saunders, J. H. Very, J. J. Vanderree, E. S. Bates, M. D., M. J. Tracy, G. Penniman.